This key should allow you to understand why you choose the option you did (beyond just getting a question right or wrong). More instructions on how to use this key can be found here.

If you have a suggestion to make the keys better, please fill out the short survey here.

Note: This key is auto-generated and may contain issues and/or errors. The keys are reviewed after each exam to ensure grading is done accurately. If there are issues (like duplicate options), they are noted in the offline gradebook. The keys are a work-in-progress to give students as many resources to improve as possible.

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1. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-3x - 3 > 9x + 3$$

The solution is $(-\infty, -0.5)$, which is option A.

A. $(-\infty, a)$, where $a \in [-2.3, 0.4]$

* $(-\infty, -0.5)$, which is the correct option.

B. (a, ∞), where $a \in [-0.15, 1.68]$

$(0.5, \infty)$, which corresponds to switching the direction of the interval AND negating the endpoint. You likely did this if you did not flip the inequality when dividing by a negative as well as not moving values over to a side properly.

C. $(-\infty, a)$, where $a \in [-0.4, 1.5]$

$(-\infty, 0.5)$, which corresponds to negating the endpoint of the solution.

D. (a, ∞), where $a \in [-1.53, -0.15]$

$(-0.5, \infty)$, which corresponds to switching the direction of the interval. You likely did this if you did not flip the inequality when dividing by a negative!

E. None of the above.

You may have chosen this if you thought the inequality did not match the ends of the intervals.

General Comment: Remember that less/greater than or equal to includes the endpoint, while less/greater do not. Also, remember that you need to flip the inequality when you multiply or divide by a negative.

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2. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-3 - 8x < \frac{-44x + 4}{7} \leq 7 - 7x$$

The solution is None of the above., which is option E.

A. $[a, b)$, where $a \in [0.3, 2.48]$ and $b \in [-13.5, -6.75]$

$[2.08, -9.00)$, which corresponds to flipping the inequality and getting negatives of the actual endpoints.

B. $(-\infty, a] \cup (b, \infty)$, where $a \in [0, 4.5]$ and $b \in [-12.75, -6.75]$

$(-\infty, 2.08] \cup (-9.00, \infty)$, which corresponds to displaying the and-inequality as an or-inequality AND flipping the inequality AND getting negatives of the actual endpoints.

C. $(-\infty, a) \cup [b, \infty)$, where $a \in [-0.75, 5.25]$ and $b \in [-11.25, -6.75]$

$(-\infty, 2.08) \cup [-9.00, \infty)$, which corresponds to displaying the and-inequality as an or-inequality and getting negatives of the actual endpoints.

D. $(a, b]$, where $a \in [-0.75, 3]$ and $b \in [-11.25, -8.25]$

$(2.08, -9.00]$, which is the correct interval but negatives of the actual endpoints.

E. None of the above.

* This is correct as the answer should be $(-2.08, 9.00]$.

General Comment: To solve, you will need to break up the compound inequality into two inequalities. Be sure to keep track of the inequality! It may be best to draw a number line and graph your solution.

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3. Using an interval or intervals, describe all the x-values within or including a distance of the given values.

No less than 6 units from the number 10.

The solution is $(-\infty, 4] \cup [16, \infty)$, which is option D.

A. $[4, 16]$

This describes the values no more than 6 from 10

B. $(-\infty, 4) \cup (16, \infty)$

This describes the values more than 6 from 10

C. $(4, 16)$

This describes the values less than 6 from 10

D. $(-\infty, 4] \cup [16, \infty)$

This describes the values no less than 6 from 10

E. None of the above

You likely thought the values in the interval were not correct.

General Comment: When thinking about this language, it helps to draw a number line and try points.

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4. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-8 - 5x < \frac{-12x + 7}{3} \leq 6 - 6x$$

The solution is $(-10.33, 1.83]$, which is option D.

A. $[a, b)$, where $a \in [-11.25, -6]$ and $b \in [-0.75, 4.5]$

$[-10.33, 1.83)$, which corresponds to flipping the inequality.

B. $(-\infty, a) \cup [b, \infty)$, where $a \in [-13.5, -6]$ and $b \in [1.5, 2.25]$

$(-\infty, -10.33) \cup [1.83, \infty)$, which corresponds to displaying the and-inequality as an or-inequality.

C. $(-\infty, a] \cup (b, \infty)$, where $a \in [-12, -6.75]$ and $b \in [1.2, 2.7]$

$(-\infty, -10.33] \cup (1.83, \infty)$, which corresponds to displaying the and-inequality as an or-inequality AND flipping the inequality.

D. $(a, b]$, where $a \in [-12, -9.75]$ and $b \in [-1.5, 6]$

* $(-10.33, 1.83]$, which is the correct option.

E. None of the above.

General Comment: To solve, you will need to break up the compound inequality into two inequalities. Be sure to keep track of the inequality! It may be best to draw a number line and graph your solution.

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5. Using an interval or intervals, describe all the x-values within or including a distance of the given values.

No more than 2 units from the number -8.

The solution is $[-10, -6]$, which is option D.

A. $(-10, -6)$

This describes the values less than 2 from -8

B. $(-\infty, -10) \cup (-6, \infty)$

This describes the values more than 2 from -8

C. $(-\infty, -10] \cup [-6, \infty)$

This describes the values no less than 2 from -8

D. $[-10, -6]$

This describes the values no more than 2 from -8

E. None of the above

You likely thought the values in the interval were not correct.

General Comment: When thinking about this language, it helps to draw a number line and try points.

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6. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$\frac{-6}{5} - \frac{4}{4}x < \frac{5}{9}x + \frac{3}{6}$$

The solution is $(-1.093, \infty)$, which is option D.

A. $(-\infty, a)$, where $a \in [-4.5, 0.75]$

$(-\infty, -1.093)$, which corresponds to switching the direction of the interval. You likely did this if you did not flip the inequality when dividing by a negative!

B. (a, ∞), where $a \in [-0.6, 1.57]$

$(1.093, \infty)$, which corresponds to negating the endpoint of the solution.

C. $(-\infty, a)$, where $a \in [0, 2.25]$

$(-\infty, 1.093)$, which corresponds to switching the direction of the interval AND negating the endpoint. You likely did this if you did not flip the inequality when dividing by a negative as well as not moving values over to a side properly.

D. (a, ∞), where $a \in [-1.2, -0.07]$

* $(-1.093, \infty)$, which is the correct option.

E. None of the above.

You may have chosen this if you thought the inequality did not match the ends of the intervals.

General Comment: Remember that less/greater than or equal to includes the endpoint, while less/greater do not. Also, remember that you need to flip the inequality when you multiply or divide by a negative.

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7. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-9 + 8x > 11x \text{ or } 5 + 7x < 8x$$

The solution is $(-\infty, -3.0)$ or $(5.0, \infty)$, which is option A.

A. $(-\infty, a) \cup (b, \infty)$, where $a \in [-3.52, -0.6]$ and $b \in [3.97, 7.8]$

* Correct option.

B. $(-\infty, a) \cup (b, \infty)$, where $a \in [-6.83, -3.3]$ and $b \in [2.7, 4.05]$

Corresponds to inverting the inequality and negating the solution.

C. $(-\infty, a] \cup [b, \infty)$, where $a \in [-4.5, -2.25]$ and $b \in [4.12, 7.72]$

Corresponds to including the endpoints (when they should be excluded).

D. $(-\infty, a] \cup [b, \infty)$, where $a \in [-7.5, -3.75]$ and $b \in [2.1, 3.38]$

Corresponds to including the endpoints AND negating.

E. $(-\infty, \infty)$

Corresponds to the variable canceling, which does not happen in this instance.

General Comment: When multiplying or dividing by a negative, flip the sign.

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8. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$\frac{10}{4} - \frac{10}{8}x \leq \frac{8}{7}x - \frac{10}{3}$$

The solution is $[2.438, \infty)$, which is option A.

A. $[a, \infty)$, where $a \in [1.5, 3.75]$

* $[2.438, \infty)$, which is the correct option.

B. $[a, \infty)$, where $a \in [-3.75, -1.5]$

$[-2.438, \infty)$, which corresponds to negating the endpoint of the solution.

C. $(-\infty, a]$, where $a \in [-3, 2.25]$

$(-\infty, -2.438]$, which corresponds to switching the direction of the interval AND negating the endpoint. You likely did this if you did not flip the inequality when dividing by a negative as well as not moving values over to a side properly.

D. $(-\infty, a]$, where $a \in [0.75, 4.5]$

$(-\infty, 2.438]$, which corresponds to switching the direction of the interval. You likely did this if you did not flip the inequality when dividing by a negative!

E. None of the above.

You may have chosen this if you thought the inequality did not match the ends of the intervals.

General Comment: Remember that less/greater than or equal to includes the endpoint, while less/greater do not. Also, remember that you need to flip the inequality when you multiply or divide by a negative.

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9. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-7x + 6 \geq -4x + 4$$

The solution is $(-\infty, 0.667]$, which is option B.

A. $(-\infty, a]$, where $a \in [-1.3, -0.3]$

$(-\infty, -0.667]$, which corresponds to negating the endpoint of the solution.

B. $(-\infty, a]$, where $a \in [0, 4.3]$

* $(-\infty, 0.667]$, which is the correct option.

C. $[a, \infty)$, where $a \in [-3.3, -0.2]$

$[-0.667, \infty)$, which corresponds to switching the direction of the interval AND negating the endpoint. You likely did this if you did not flip the inequality when dividing by a negative as well as not moving values over to a side properly.

D. $[a, \infty)$, where $a \in [-0.1, 2.6]$

$[0.667, \infty)$, which corresponds to switching the direction of the interval. You likely did this if you did not flip the inequality when dividing by a negative!

E. None of the above.

You may have chosen this if you thought the inequality did not match the ends of the intervals.

General Comment: Remember that less/greater than or equal to includes the endpoint, while less/greater do not. Also, remember that you need to flip the inequality when you multiply or divide by a negative.

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10. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-6 + 7x > 9x \text{ or } 6 + 4x < 7x$$

The solution is $(-\infty, -3.0)$ or $(2.0, \infty)$, which is option C.

A. $(-\infty, a] \cup [b, \infty)$, where $a \in [-2.15, -1.67]$ and $b \in [2.06, 4.54]$

Corresponds to including the endpoints AND negating.

B. $(-\infty, a] \cup [b, \infty)$, where $a \in [-3.44, -2.54]$ and $b \in [1.46, 2.53]$

Corresponds to including the endpoints (when they should be excluded).

C. $(-\infty, a) \cup (b, \infty)$, where $a \in [-5.33, -2.92]$ and $b \in [1.65, 2.77]$

* Correct option.

D. $(-\infty, a) \cup (b, \infty)$, where $a \in [-2.4, -0.75]$ and $b \in [2.7, 4.88]$

Corresponds to inverting the inequality and negating the solution.

E. $(-\infty, \infty)$

Corresponds to the variable canceling, which does not happen in this instance.

General Comment: When multiplying or dividing by a negative, flip the sign.